

REMARKS

Claims 16 and 18-30 are pending in the application.

Claims 16 and 18-30 stand rejected.

Claims 16, 18, 24, 26 and 29 are amended.

Claims 16 and 18-30 remain in the case for reconsideration.

Reconsideration is requested. No new subject matter has been added.

35 U.S.C. § 102

Claim 29 stands rejected under 35 U.S.C. § 102(a) as being anticipated by Brown (U.S. Patent No. 5,835,687), hereinafter "Brown".

The rejection is traversed, however claim 29 has been amended to further clarify the subject matter and to facilitate bringing this case to allowance.

Claim 29 recites, in part, a method comprising:

“generating a set of multiple different random seed values from a random number generator independently of any image information associated with the array of pixels and independently of any error diffusion values associated with any of the pixels including generating random seed values associated with a first set of the array of pixels to be printed for a digital image;

initializing the multiple different error buffers for use as an initial set of error values for the array of multiple different pixels prior to starting any error diffusion operation;

adjusting the multiple different random seed values independently of any image information such that all of the random seed values are relatively large to increase the likelihood that dots will be printed sooner when a transition occurs between a zero image region and a nonzero image region;

initializing a first set of the error buffers associated with the first set of the array of pixels to be printed for the digital image with the adjusted random seed values that were generated independently of any image information and adjusted prior to the starting of the error diffusion operation”

In rejecting claim 29, the Examiner suggests that a single sentence in Brown discloses a number of the features recited in claim 29. Specifically, the Examiner identifies column 4 line 65 to column 5 line which states “Those skilled in the art will recognize that to process color images the scanner 30 will also make color separations of the image”. According to the Examiner, this single sentence anticipates: generating a set of multiple different random seed values, initiating the multiple different error buffers associated with the array, and initializing a first set of the error buffers associated with the first set of the array of pixels.

The Applicant traverses these inferences as being impermissible hindsight. Brown deals primarily with digital halftoning, which “involves a process of converting an image comprising a large number of gray levels to a reduced number of gray levels” (Col. 1 lines 18-20). The fact that Brown recites making color separations in no way discloses generating multiple different random seed values or initiating multiple different error buffers for each color separation. In the absence of any relevant disclosure in Brown, one skilled in the art would necessarily assume that Brown is suggesting that the colors would be processed according to the conventional manner whereby “identical CMY (K) error diffusers having identical seed values are run independently of each other” as discussed in Applicants Background at page 3, lines 19-23. Therefore, rather than anticipating claim 29, Brown illustrates one of the problems that Applicant’s invention addresses.

In addition, neither Brown nor any other reference discloses “adjusting the multiple different random seed values independently of any image information such that all of the random seed values are relatively large to increase the likelihood that dots will be printed sooner when a transition occurs between a zero image region and a nonzero image region” where the adjusted random seed values are “adjusted prior to the starting of the error diffusion operation”, as recited in the amended claim 29.

35 U.S.C. § 103

Claims 16 and 27 stand rejected under 35 U.S.C. § 103(a) according to Brown et al., in view of Lau (U.S. Patent No. 6,798,537), hereinafter “Lau”.

The rejection is traversed, however claim 16 has been amended to further clarify the subject matter and to facilitate bringing this case to allowance.

Claim 16 recites, in part, a method comprising:

“generating a set of multiple random seed values from a random number generator independently of any image information associated with the array of pixels for initializing the error buffers and for use as initial error values when starting an error diffusion operation including generating random seed values associated with a first set of the array of pixels to be printed for a digital image;

adjusting each of the random seed values from the random number generator prior to starting the error diffusion operation such that the adjusted random seed values associated with the array of pixels are relatively large, likely to cause a dot to be printed and increase the likelihood that dots will be printed sooner when a transition occurs between a zero image region and a nonzero image region; and

initializing the error buffers associated with the array of pixels with the set of adjusted random seed values that were generated independently of any image information associated with the array of pixels and adjusted prior to starting the error diffusion operation for reducing startup transients during the error diffusion operation including initializing a first set of the error buffers associated with the first set of the array of pixels to be printed for the digital image with adjusted random seed values that were generated independently of any image information and adjusted prior to the starting of the error diffusion operation”

The rejection is traversed, in part, for the same reasons as discussed with reference to claim 29, above. In addition, Applicant traverses the obviousness rejection made in combining Lau with Brown.

Lau discloses at column 10, line 65 to column 11, line 9 an algorithm provided to “assign to each element (of an array) a probability of that element becoming a minority pixel” wherein the algorithm further “converts the most likely elements to minority pixels” and “adjusts, at each iteration, the probability of each majority pixel in the array according to the current set of minority pixels.”

Lau appears to suggest that the initial selection of probabilities is done in an uncorrelated manner after which the probability of each pixel is then “adjusted according to the desired pair correlation” (column 11, lines 13-16). Lau therefore describes adjusting the probability of each pixel. Nowhere does Lau disclose where multiple random seed values themselves are adjusted as described in claim 16.

As recited in the amended claim 16, the random seed values are adjusted prior to starting the error diffusion operation. In contrast, the adjustment of probability disclosed in Lau would necessarily occur after starting an error diffusion operation, since each iteration of the adjustment of probabilities is done “as each new minority pixel is added” (column 11, lines 9-13). See also column 12, lines 8-20, where Lau describes three steps that: 1. provide for “uniformly distributed random numbers”, 2. operate on the pixels, and then 3. “adjust the probability” (column 12, lines 8-10). Therefore, the adjustment of probability as disclosed in Lau operates very differently from, and does not anticipate, Applicant’s adjustment of the seed values.

Examiner references FIG. 12 of Lau as teaching the claim 16 feature of printing a dot sooner when a transition occurs between a zero image region and a nonzero image region. However, rather than illustrating a transition between a zero image region and a nonzero region as recited in claim 16, FIG. 12 instead illustrates the results of controlling an amount of overlap between pixels of different colors. Clearly a pixel having a color is not a zero image region.

Claims 18-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over various combinations of Brown, Lau, Mintzer (U.S. Patent No. 5,210,602), Shiau (U.S. Patent No. 5,880,857), Levien (U.S. Patent No. 5,276,535), and Nakamura (U.S. Patent No. 5,339,134).

Independent claims 18 and 24 have been amended to include some of the same features as recited in amended claims 16 and 29. The rejections are traversed for the same or similar reasons as discussed above, in addition to any and all arguments provided in prior Amendments made by the Applicant. In addition, each of the dependent claims includes features not disclosed by the cited references.

For example, claim 26 recites “selecting only the seed values with relatively large values with respect to other seed values such that all of the adjusted seed values have a relatively large value”. None of the cited references disclose selecting a seed value with a relatively large value.

To the contrary, for example, Lau describes “uniformly distributed random numbers” (see column 12, lines 8-20).

CONCLUSION

Claims 16, 18, 24, 26 and 29 have been amended. No new matter has been added by this amendment. Allowance of all claims is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Customer No. 46404

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

A handwritten signature in cursive script that reads "Bryan D. Kirkpatrick". The signature is written in dark ink and is positioned above a horizontal line.

Bryan D. Kirkpatrick
Reg. No. 53,135

MARGER JOHNSON & McCollom
210 SW Morrison St., Suite 400
Portland, OR 97204
(503) 222-3613